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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/558,425	07/07/97	BARRETT	P-3568-2

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EXAMINER  
MONTGOMERY, C

ART UNIT	PAPER NUMBER
2201	8

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

<b>Office Action Summary</b>	Application No. <b>08/888,425</b>	Applicant(s) <b>Barrett</b>
	Examiner <b>Montgomery, C. Keith</b>	Group Art Unit <b>2201</b>

☒ Responsive to communication(s) filed on Jul 7, 1997

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

**Disposition of Claims**

☒ Claim(s) 1-5 and 7-19 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-5, 7-9, 13-17, and 19 is/are rejected.

☒ Claim(s) 10-12 and 18 is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

**Application Papers**

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☒ The drawing(s) filed on Jun 5, 1996 is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

**Attachment(s)**


☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

  
**MICHAEL J. CARONE**  
**SUPERVISORY PATENT EXAMINER**  
**GROUP 2200**

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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#### DETAILED ACTION

1. The drawings (figures 1-4) are objected to under 37 CFR 1.83(a) because they fail to show tail fin stabilization as described in the specification (from the amendment filed 7/7/97). Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Correction is required.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-4, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lawhorn et al (henceforth "Lawhorn") in view of Albrektsson et al ("Albrektsson"), and further in view of Maudal et al ("Maudal"). In figure 2, Lawhorn discloses a bullet guidance system comprising:

logic circuit means 162;

piezoelectric steering control means 102 (see column 2, lines 64-66);

miniature power supply means 160; and

a conventional powder charge (see column 2, lines 10-13).

However, Lawhorn discloses a beam-rider guidance system, rather than a forward-looking semi-active scheme. Also Lawhorn discloses a fluidic divert system to steer his projectile, rather than a flap.

Albrektsson teaches that a gun-launched projectile may be guided by a forward-looking semi-active scheme. Albrektsson uses three spaced detectors to collect reflected laser energy (column 5, lines 49+), where the received energy is amplified and used to control the path of the projectile. In light of this teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to utilize a semi-active guidance system in the projectile of Lawhorn, as this system requires no spatial encoding of the guide beam laser.

Maudal teaches that a projectile may be guided by deformable flaps 62 which are actuated by a hydraulic cylinder 64 (see figure 9-12). In light of this teaching, it would have been obvious

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to one of ordinary skill in the art at the time the invention was made, to substitute the fluidic divert system of Lawhorn with deployable flaps, in order to steer the projectile formed by the combination of Lawhorn and Albrektsson. These flaps are preferable to the diverted flow system of Lawhorn, because of the relative simplicity of the flap/actuator arrangement. While the Maudal actuators are hydraulic, piezoelectric actuators of this type are well known in the guided projectile art, as shown by the piezoelectric valve actuators of Lawhorn (column 2, lines 64+).

As to claim 3, the inclusion of amplification circuitry in a microchip is well known, and not deemed a patentable distinction.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lawhorn in view of Albrektsson, and further in view of Maudal, as applied to claims 1-4, 7 and 8 above, and further in view of Schneider. When combined with Albrektsson and Maudal, Lawhorn discloses the invention substantially as claimed. However, Lawhorn does not disclose the manner in which his control circuitry is mounted within the projectile.

In figure 3, Schneider shows that circuit cards 120 may be mounted on a transverse bulkhead (plate) 118. This configuration allows the cards to cool during operation. For this reason, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to mount the control circuitry of Lawhorn in a similar manner. While the circuit boards of Schneider are mounted aft of the bulkhead, this distinction with the requirement of claim 5 is not deemed a patentable one. The reversal of the location is considered a design choice dictated by the required location of the circuitry in a particular projectile, and therefore obvious to the skilled artisan.

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lawhorn in view of Albrektsson and Maudal, as applied to claims 1-4, 7 and 8 above, and further in view of Tura et al. When combined with Albrektsson, Lawhorn discloses the invention substantially as claimed. However, Lawhorn does not disclose a lithium-polymer battery.

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Tura et al teach that their lithium-polymer cells are thin, have high storage capacity, and have a long shelf life (column 1, lines 63+). In light of this teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to replace the thermal cell of Lawhorn with a lithium-polymer cell, to achieve the advantages recited by Tura et al.

6. Claims 13-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lawhorn in view of Albrektsson. In figure 2, Lawhorn discloses a bullet guidance method comprising:

firing the bullet from a weapon using a cartridge (col. 2, lines 10-13); and  
altering flow about the projectile using piezoelectric steering control means 102, where flow at the inlet spike is regulated by the switching device (see Abstract, and column 2, lines 64-66);  
wherein the apparatus comprises  
miniature power supply means 160; and  
microprocessor 162.

Lawhorn discloses a beam-rider guidance system, rather than a forward-looking semi-active scheme.

Albrektsson teaches that a gun-launched projectile may be guided by a forward-looking semi-active scheme. Albrektsson uses three spaced detectors to collect reflected laser energy (column 5, lines 49+), where the received energy is amplified and used to control the path of the projectile. In light of this teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to utilize a semi-active guidance system in the projectile of Lawhorn, as this system requires no spatial encoding of the guide beam laser.

7. Claims 10-12 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The patents to Hershey et al and to Muirhead et al are cited to show instrumented bullets.

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9. Applicant's arguments filed 7/7/97 have been considered but are not deemed persuasive. Applicant has argued that Lawhorn teaches away from using a deployable airfoil for path correction. However, applicant has not cited any passage in which Lawhorn discourages the use of such an airfoil. In re Fine states that obviousness is tested by "what the combined teachings of the references would have suggested to one of ordinary skill in the art," and "teachings of references can be combined only if there is some suggestion or incentive to do so." Maudal provides an effective, simplistic method for the correction of a projectile's flight path. The examiner has provided the incentive in asserting that the radially deployed flaps of Maudal are much less complex than the internal flow diversion arrangement disclosed by Lawhorn et al. The patent to Solderberg is additionally cited to show the extent of use of such deployable flaps.

Applicant has also argued that the Lawhorn patent is not addressing the same problem as is disclosed in the instant specification. However applicant has stated the problem so narrowly as to exclude any prior art. The instant specification and Lawhorn both clearly address the same problem: the guidance of a bullet to a target. Lawhorn differs only in the **method** of solving the problem. Maudal is incorporated for his teaching that deployable flaps are useful in altering a projectile flight path, and Solderberg is further cited to show that these devices have been in use for some time. Lawhorn, while admittedly using a different steering apparatus, does not appear to teach away from the use of a deployable flap.

Applicant has further argued that the function of Lawhorn's device is destroyed by the incorporation of the teaching of Albrektsson. The Albrektsson reference is cited solely for its teaching of laser illumination of a target to guide a gun-launched projectile (i.e. "semi-active" guidance), and is combined with Lawhorn, who uses a spatially encoded beam (a "beam rider"). It is not clear that the function or structure of Lawhorn would be destroyed by the incorporation of the teaching of Albrektsson. Indeed, in the guidance art, semi-active and beam rider type guidance systems are both well known and commonly substituted for one another. The Sepp et al patent is cited to show the interchange ability of these two schemes. Further references with similar teaching can be furnished upon request.

In summary, the examiner's assertions of obviousness are as follows:

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1. The substitution of deployable flaps in the invention of Lawhorn would have been obvious to the skilled artisan, in view of the teaching of Maudal: Deployable flaps are known in the art, and the incentive to incorporate flaps in Lawhorn's projectile lies in the relative simplicity of the flap configuration.
2. Lawhorn solves the same problem as the instant invention. Both Lawhorn and the instant specification address the problem of how to guide a bullet to a target. They diverge only in their methods.
3. The substitution of a semi-active guidance system for the beam rider of Lawhorn would have been obvious: Both forms of guidance are well known and commonly employed, and their substitution for one another would represent a routine design choice to the skilled artisan.

For these reasons, the rejections under 35 U.S.C. 103(a) are maintained.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keith Montgomery whose telephone number is (703) 306-4164.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone, can be reached at (703) 306-4198. The fax phone number for this Group is (703) 306-4195.

Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [michael.carone@uspto.gov].

All Internet e-mail communications will be made of record in the application file. PTO employees do not engage in Internet communications where there exists a possibility that sensitive information could be identified or exchanged unless the record includes a properly signed express waiver of the confidentiality requirements of 35 U.S.C. 122. This is more clearly set forth in the Interim Internet Usage Policy published in the Official Gazette of the Patent and Trademark on February 25, 1997 at 1195 OG 89.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 306-4177.

*CKM*  
C. Keith Montgomery  
September 18, 1997

  
MICHAEL J. CARONE  
SUPERVISORY PATENT EXAMINER  
GROUP 2200